

# PATENT ABSTRACTS OF JAPAN

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## (54) UV CURABLE PRESSURE SENSITIVE ADHESIVE

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To obtain the subject adhesive being a liquid at an ambient temperature, and cured by ultraviolet rays to exhibit a good peeling strength from a high to a low temperature by containing a specific polyacrylate, vinyl ether and an onium salt photo initiator in each specific ratio.

**SOLUTION:** This UV curable pressure sensitive adhesive contains (A) 60-90 pt.wt. polyacrylate having a pendant part, (B) 10-40 pt.wt. vinyl ether and (C) 1-4 pt.wt. onium salt photo initiator based on 100 pts.wt. component (A). The component (B) is preferably has a low viscosity and (-)50-(-)10° C Tg value, and e.g. butyl vinyl ether, ethylhexylvinyl ether, etc., can be cited. Also, the component (C) is preferably sulfonium hexafluoroantimonate. Thereby, it is possible to obtain an adhesive being a liquid at an ambient temperature, and cured by ultraviolet rays to exhibit a good peeling strength over 85-(-)40° C.

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## LEGAL STATUS

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[Detailed Description of the Invention]

[0001] The pressure sensitive adhesive is used for various applications for the ease of handling, and the moment adhesive property. Although there is an ingredient which can be used at either an elevated temperature or low temperature, the ingredient which can be used in both environment of these is not established yet. For example, to offer the pressure sensitive adhesive which can be used for autoclaves within a hood is desired. However, at low temperature, the ingredient which gives adhesion firm enough at an elevated temperature stiffens, and loses an adhesive property. On the other hand, at an elevated temperature, it softens and the ingredient which has reinforcement and flexibility at low temperature becomes brittle.

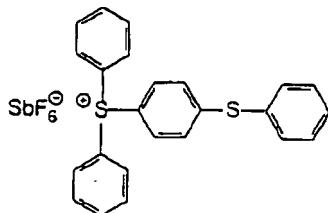
[0002] This invention is UV hardenability adhesives constituent containing the polyacrylate which has a photosensitive pendant part, vinyl ether, and an onium salt photoinitiator. This constituent is a liquid in ambient temperature, and is a pressure sensitive adhesive in which it hardens by ultraviolet rays and good peel strength is shown over 85--40 degree C.

[0003] Polyacrylate is a saturation polymer chain manufactured from an acrylate monomer, and this chain also contains a photosensitive pendant part. A photosensitive pendant radical is combined with polyacrylate by association of sufficient die length to promote intermolecular association. Generally this polymer has the weight average molecular weight of 2,000-10,000. Desirable polyacrylate is sold by BASF A.G. by trade name AKURONARU (ACRONAL) 3429 and AKURONARU 3458. Polyacrylate will recognize 60-90 weight section existence into the constituent of the 100 weight sections.

[0004] Desirable vinyl ether has low viscosity and it has Tg value which is -50+10 degrees C. Especially desirable vinyl ether is C4 - C10 vinyl ether. This ether can also contain a hydroxy group. The examples of vinyl ether are butyl vinyl ether, ethylhexyl vinyl ether, ethyl vinyl ether, isopropyl vinyl ether, cyclohexyl vinyl ether, isobutyl vinyl ether, and hydroxybutylvinyl ether. More desirable vinyl ether is butyl vinyl ether. Vinyl ether will recognize 10-40 weight section existence into the constituent of the 100 weight sections.

[0005] A desirable onium salt photoinitiator is the diaryl iodonium salt, triarylsulfonium salt, and ferro SENIUMU salt with which starting cation hardening is known. Such salts are explained by United States patent 4,069,055th and No. 4,058,401 (Crivello) in full detail. Desirable onium salt is : [0006] which is hexafluoro antimonic acid sulfonium of the following structure expression which can come to hand from Union Carbide.

[Formula 1]



[0007] the amount of arbitration with these initiators effective in initiation of a hardening process -- existing -- general -- polyacrylate, and per [ 0.1 ] vinyl ether 100 weight section - 10 weight sections -- it exists in the amount of 1 - 4 weight section preferably -- I will come out.

[0008]

[Example] Several sorts of adhesives constituents by this invention were manufactured, and typical UV hardenability adhesives system and the following formats compared peel strength. The class product was given to the Mylar (Mylar) base material, and it irradiated for 3 seconds by the ultraviolet rays from the fusion (Fusion) UV system of 300W, and D type electric bulb. The base material suited 6cm from the light source. Subsequently, it was pasted mutually, having applied the 5pound platen to the hardened covering film, and it was made the adhesion laminate. Subsequently, it cut by making this laminate into 180-degree friction tests to the intercept with a width of face [ of 2.54cm (1 inch) ], and a die length of 15.24cm (6 inches). The friction test was carried out by the Instron tension unit.

[0009] The result of the presentation of a sample and a peel strength trial is shown in Table 1. The presentation of a sample is expressed with the weight section. IRGACURE (Irgacure) is the trade name of the standard photoinitiator which can come to hand from Ciba-Geigy. n/m reports a peel strength value. The sample constituents A and B are this invention samples, and C and D are compounds standard as UV hardenability adhesives.

[0010]

[Table 1]

組成 重量部	A	B	C	D
アクロナル3429	75	75	75	75
ブチルビニルエーテル	25			
エチルヘキシルビニルエーテル		25		
アクリル酸エチルヘキシル			25	
アクリル酸テトラヒドロフルフリル				25
ヘキサフルオロアンチモン酸 スルホニウム	1	1		
イルガキュア1173			1	1
剥離値 N/m				
-40°C	400	550	400	350
22°C	800	850	250	300
85°C	530	450	50	70

[0011] These data show that the case where the sample constituent A and B per peel strength are standard compounds is excelled.

## CLAIMS

### [Claim(s)]

[Claim 1] (i) UV hardenability adhesives constituent which contains the onium salt photoinitiator of 1 - 4 weight section to the polyacrylate 60 which has a photosensitive pendant part - 90 weight sections, (ii) vinyl ether 10 - 40 weight sections, polyacrylate, and the 100 weight sections of vinyl ether.

[Claim 2] The adhesives constituent according to claim 1 with which polyacrylate is chosen from the group of the polyacrylate currently sold by BASF A.G. by trade name AKURONARU 3429 and AKURONARU 3458.

[Claim 3] The adhesives constituent according to claim 1 with which vinyl ether has low viscosity and Tg value of -50-+10 degrees C.

[Claim 4] The adhesives constituent according to claim 1 chosen from the group which vinyl ether becomes from butyl vinyl ether, ethylhexyl vinyl ether, ethyl vinyl ether, isopropyl vinyl ether, cyclohexyl vinyl ether, isobutyl vinyl ether, and hydroxybutylvinyl ether.

[Claim 5] The adhesives constituent according to claim 1 whose photoinitiator is hexafluoro antmonic acid sulfonium.